

## Introduction

Cheese is one of the favorite and popular food in many countries (CDIC, 2014) because of the health benefits and flavour that are associated with it. Natural probiotic and anti-tumour properties are some of the health benefits offered (Goldin and Gorbach, 1992). Moreover, cheese is also loaded with calcium or as a source of proteins and phosphorus (USDA, 2011), dietary calcium (IOM, 2011), and has been proven to help in reducing the incidence numbers of type II diabetes (Mozaffarian et al., 2010).

Cheese is a nutritious, multipurpose dairy food (O'Brien and O'Connor, 2004) which took part in the history of human diet. Gorgonzola as reported by Robinson and Wilbey (1998) was first documented in literature around 897 AD and Cheddar was around 1500 AD. The main purpose of the cheese production is to conserve and prolong the shelf-life of milk (Fox and McSweeney, 2004), while at this present days, cheese has become a primary food in contemporary meals and is relished because of its sensory characteristics (Delahunty and Drake, 2004).

Three servings of dairy typed products are recommended for daily consumption to have the prime calcium intake and the kindness of all the nutritional values that milk has to offer (Milk SA, 2011). The activity promotes and portrays dairy products as nutrient dense and rich with nutritional values, also the ratio between its nutrient content (in grams) is higher compared with the total calorie level (Milk SA, 2011).

With all of those nutritional offerings, cheese has become a potential answer to achieve the UN goal of a world without hunger and malnutrition in all its forms by 2030 (Unicef, 2018). Quote from Unicef report in 2018, “nearly 151 million children aged under five too short for their age due to malnutrition in 2017, compared to 165 million in 2012. Globally, Africa and Asia accounted for 39 percent and 55 percent of all stunted children”. The World Bank said that “stunted indicates not only a failure to achieve one’s own genetic potential for height but is also a predictor of many other developmental constraints, including cognitive deficits and future economic opportunities, including impeding a country’s ability to accumulate human capital” (Worldbank, 2019). Moreover, as reported

at worldhunger.org that 70% of all malnourished children in the world live in Asia and 512 million adults and children in Asia consume too few calories, which accounts for over 12% of the total population of Asia (Merckel, 2015). It clearly said that the present time, the health sectors are focusing on finding solutions for the rising stunting issue.

In Indonesia, there are 8.4 million children or 37.2% of children under five are stunted, and incidences of stunting increased from 35.6 to 37.2 percent in between 2010 and 2013 (Worldbank, 2015). Meanwhile a comparison to developed country especially from European continent, there was zero reports of malnutrition cases in Switzerland over the past decade, especially for children under five years old and eligible women. The only issue in concern with malnutrition was in 2015 to the elderly, especially to the oldsters who are under medical treatment because of loss of appetite due to acute illness worsens nutritional status (Schuetz, 2015).

The global cheese market in 2016 was valued at approximately 95.2 billion USD (Statista, 2016). According to milk products food report 2019, most revenue generated in the U.S, followed by Russia, France, Germany and Turkey (Statista, 2019).

The annual consumption of cheese worldwide in 2018, as reported by Statista, the European Union's consumption of cheese amounted to some 94 million metric tons, followed by the United States with 56 million metric tons and Russia 12 million metric tons (Statista, 2018a). As for the Asian countries, the annual cheese consumption in 2018 was led by Japan, Australia and South Korea with 331, 296, and 163 thousand metric tons consecutively (Statista, 2018b). Denmark has the highest level of per capita cheese consumption with 28.1 kilograms. Danish people on average ate 28.1 kilograms of cheese. Iceland and Finland came in second and third in that year at 27.7 and 27.3 kilograms of cheese per capita (Statista, 2018b). Cheese consumption in Switzerland per person per year is 22.2 kilograms in 2018 (Statista, 2018b), while Indonesian cheese consumption per capita in 2017 is only at 0.25 ons thought statistic showed a significance increase by almost quintuple over the past 5 years (MoA, 2017).

The primary cheese consumption per person per year in the U.S. increased almost 2% from 2001 to 2002. Interestingly, during the last quarter of the 20th century, cheese consumption kept on growing while fluid milk consumption was decline dramastically. As recorded, the natural cheese consumption per per person per year has been increased roughly 75% since 1980 (USDA/ERS, 2003).

Global cheese trade percentage continued to enlarge by two and a half in 2017. Most of the worldwide cheese traded in 2017 were originated in the United States (+18.5%) and the European Union (+3.7%). The cheese varieties from European Union continued to make strong influences in the Japanese cheese market, and in year 2017 it overtakes the export of Australia's cheese to Japan (FAO, 2018). Asia has become the largest cheese exports target market and engaged 50 percent of world exports, with the top three countries are Japan, China and the Republic of Korea. Cheese consumption per capita has a significant increase in East Asia, driven by the rising earnings of people, their food habits changes and the deployment of food court and restaurant chains that put cheese as one of the main ingredients for the foods (FAO, 2018).

The growing awareness of health and human wellness has remarkably changed to consumer usual consumption and their buying behaviors. Low carbohydrate diets, be more aware of obesity and trans-fat, and follows with the increasing demand for organic and natural foods are forcing a shift of supplier's paradigm in what it is marketed and the way it is marketed. Convenience has constantly been a driving aspect of the consumer demand in the food industry. Following the pace of life hustle, consumer expectations and demands continue to rise out of the factors, whether for the ease of food preparation, greater portability and benefits or for the convenience reason.

Cheese is actually the fastest growing food categories among other organic dairy products. The demand for products perceived to be natural and healthy is fueling the trend of consumer choices. This phenomenon is driving the cheesemaker and dairy producer interest to improve the quality to meet the market demands.